

What ails Indian science*

J.B.S. Haldane (1892–1964)

*Various observations of J.B.S. Haldane on slow growth and unworthiness of Indian science written in different contexts and at different times have been culled from his articles collected in the book *Science and Indian Culture* (New Age Publ., Calcutta 1965, (second edition 1991)) and put together here. They deal with such issues as un-professionalism, narrow specialization, new caste system in academia, teaching and learning of science, brain drain, etc. Haldane's criticisms and suggestions for betterment of Indian science are still valid.*

*Haldane needs no introduction. A graduate in 'Classics' (i.e. Greek and Latin literature and language) from Oxford, he taught mathematics, statistics, physiology, biochemistry and many other subjects in different universities. He started helping his father in scientific research from the age of eleven. His first research paper was written jointly with his illustrious father J. S. Haldane and his colleague C. G. Doglous which J.B.S. read before a meeting of the Physiological Society in London when he was only seventeen years of age. At the age of twenty, he published important research results in 1912 in *Journal of Physiology*. He was a prolific writer and was recipient of 'Kalinga Prize' of UNESCO for science popularization. He migrated to India in 1957 where he spent the rest of his life. He and his wife Helen Spurway adapted an Indian way of life. He mentioned this as an example of reverse brain drain. Some Indian scientists feel that Haldane could induce a radical change in biological research in India. Some of them also feel that he himself was a spent up force as scientist when he came to India. All the same his 'greatness' as a teacher, scientist and as a human being is remembered affectionately by all who came to know him. — Subir K. Sen (Department of Library and Information Science, University of Calcutta, Asutosh Building, 3rd Floor, College Street, Calcutta 700 073, India)*

Politeness and un-professionalism

I[JBS] have already come to one conclusion as to why science in India is developing with disappointing slowness. It is not because Indians are stupid or lazy. It is because they are too polite. They spend hours daily in conversation with others, not on professional matters, but on personal topics. In London, I talked with colleagues for an hour or more, daily, but it was mostly about the details of our work. In the Indian Statistical Institute (Calcutta) the same is true. But it is not true in most academic institutions where I have been in India. Again at scientific meetings and usually in ordinary discussion my Indian colleagues are polite about one another's work. In Europe, we are usually polite about the work of juniors, and highly critical of that of men and women of established reputation. At a recent international meeting on genetics, an American got up after a paper read by my wife and said that he could not let her highly misleading views pass without criticism. She felt that she had at last reached the status where one is criticized without mercy. She and I at once formed a friendship with the critic. We had something to talk about. In my opinion, only a few branches of Indian science have reached the stage of maturity where this is possible. I may criticize some of my colleagues as I would criticize British colleagues, and hurt their feelings severely. Once again I am up against the choice between politeness and efficiency. I do not know how I shall resolve this dilemma. I hope that as Indian science grows up, it will become less acute¹.

New caste system

I notice that in India a new caste system is developing before the old one has disappeared. The new system is based on academic degrees. One cannot teach Bengali, chemistry, history, or what you will, without a degree in that subject. And a higher degree given for research is almost obligatory if one hopes for a professional chair. It is only a question of time before I am debarred from teaching science or statistics, since I have no degree of any kind in these subjects. But in terms of the new caste system, I am qualified to teach the classics since I secured a somewhat marginal first class in Literae Humaniores, vulgarly called 'Greats' at Oxford².

In India it appears to be necessary to have a degree in a subject before one can teach it in a university or even a college. This requirement is perhaps most utterly ludicrous in the case of the various languages spoken in India. A friend of mine was refused a post to teach his native language because he had no degree in it although he had published a fair amount of verse in it, which many people regard as poetry. He has a degree in another subject. But even more fatal is the practice, which prevails in one university at least, of refusing to accept a student for the M A course in any science unless he has taken a B Sc degree with Honours in that particular science. This is calculated to ensure, so far as is possible, that Indian scientists will be specialists, whereas men like Jagadish Bose, Meghnad Saha, and Prasanta Chandra Mahalanobis have achieved eminence precisely by bridging the gaps between different sciences³.

I have just declined a request to propose a candidate for a professorship of statistics in a certain university because the qualifications included a degree awarded for research in mathematical statistics. I know many of the world's leading statisticians, and very few of them have such degrees. They improved statistical practice because they had to deal with large numbers of observations about atoms like S. N. Bose, jute yields like P. C. Mahalanobis, heights of human beings and their relatives like R. A. Fisher, earthquakes like H. Jeffreys, and so on. They had degrees, but not in statistics.

Someone might however, say that statistics as a special case, being a very young science, but that in the older sciences such specialization was needed. This is utter nonsense. Let me take some examples.

Prof. P. A. M. Dirac is Professor of mathematics at Cambridge. He might equally well be called a Professor of mathematical physics or even of statistics. He took his degree in engineering. On the continent of Europe many of the Professors not merely of such sciences as physiology and anatomy, but of zoology and botany, have medical degrees only. At University College London, the Professor of anatomy, J. Z. Young, has a degree in zoology. He had not dissected a human corpse systematically until he got his present post, though he had made distinguished contributions to human anatomy by his work on the healing of severed human nerves. I could go on almost indefinitely⁴.

The old caste system had this merit, that the richest merchant or Zamindar could not buy the status of brahmin for his son, even if the son was learned and pious. Whatever the defects of that system – and I think that they were and are grievous – it was not subservient to wealth. The new caste system which the university administrative authorities, with the connivance of many government officials, are trying with some success to impose upon India, has no such

excuse. I hope that steps may be taken to break it before it exercises the same paralytic effect on India as the old one did in the past⁵.

Teaching and learning

I have been teaching science for just forty years, and it was a shock to me when I found that my basic assumptions about such teaching do not work in India.

I was walking near my house one Sunday afternoon when I was listening to some mantras, and asked my companion if he could identify them. The practice of repeating religious formulae is of course about as common in Europe as in India, and I have little doubt that it has an effect in guiding the thoughts of the chanter in a certain direction, even when the chanting has become quite automatic. It is not so sure that it guides them towards the kind of experience which a few holy men all over the world have shared, even though they described it in different words, or stated that it could not be described in words.

But my companion stated that the language of the chant was English and the subject organic chemistry. We returned, and I found that he was right. The subject of the chant was the preparation of aliphatic amines, with special reference to various precautions. I have learnt a great deal in this way, and have very considerable stock of poetry, in at least ten languages, and eleven if you consider, as I do, that some parts of the Koran are great poetry. Clearly one must learn poetry exactly.

But I have never learned any scientific fact in this way. On the contrary, I try to learn them in as many different ways as I can and to teach them from many points of view. For example, in teaching medical students about the parts of the human heart, I tried to make them imagine where these parts were within their own chest and what course the blood took through them. In teaching statistics, I try to jump from the duration of human lives to those of safety razor blades and back, to encourage a similar agility of mind in my hearers.

The knowledge of science is, or rather should be, something quite different from the knowledge of poetry.

The kind knowledge, which is most useful in science, is a very long way from that which gets one a first class in a written examination. I am remarkably ignorant of many facts which some of my junior colleagues know. But I know where to look them up, though unfortunately some of the books and journals are not available in India. What is even more important, I know fairly well what is not known. When one of my young colleagues made what turned out to be a completely original observation I said that I thought nobody had ever noticed such a thing before, and told him to write to two men in Europe and USA to confirm this. Much of my success in research has been due to my knowledge concerning human ignorance. So far as I know this peculiar kind of knowledge is never taught⁶.

Double loyalty of a scientist

Every year hundreds of Indian students of science go abroad hoping to return as Doctors of Philosophy. I am absolutely opposed to this practice, and regard

a foreign degree as a point against anyone who wishes to work with me. But I am aware that such degrees are a help in obtaining posts in universities and elsewhere in India. In the three universities where I worked in England, namely Oxford, Cambridge and London, we were sufficiently confident of ourselves to ignore degrees. Men and women were chosen for academic posts mainly on their published work and their record as teachers. It was unusual, though not unique, to get a series of professorships, as I did, without any scientific degree at all. It is quite common to take a degree in one science and do teaching and research in another. I hope to see this common in India also. One reason why Indian graduate students wish to go abroad is a very simple one. They are systematically humiliated by the administrative staff of many institutions, and sometime by professors, in a manner, which is not tolerated in western Europe or United States. Again I hope to live to see this remedied⁷.

Every scientist who is worth anything has a double loyalty, to science as well as to his country. In India, there are numerous laboratories where scientists are forbidden to work. I can think of one in Calcutta where a worker drew Rs 400/- per month for at least six months without doing anything but filling in forms about work in contemplation and showing visitors around. The worker in question could have done some research, not probably very important, but was ordered to remain in the laboratory beside an incomplete apparatus, and explain the project to visitors. This is not an isolated case. All over the country, junior workers are regarded with jealousy by their superiors, who either discourage originality or steal its results. I recently saw a bibliography of publications by the head of a well-known Indian laboratory. This remarkable man had published over fifty scientific papers in one year. No single human being before him has ever made discoveries at this rate! No doubt junior colleagues had done most of the work, or all of it. But their names were not mentioned. It is not surprising that young men do not care to work under such conditions, particularly, if like the unfortunate agricultural scientist who recently hanged himself in Delhi, they are forbidden to apply for posts elsewhere. So long as the Government concerned does nothing to discourage persons responsible, bright young men will take jobs abroad⁸.

The root cause of all this incompetence and worse is not far to seek. A large number of Indian scientists have no pride in their profession, though they are proud of their salaries and positions. The opposite attitude is common in Europe, as it was in ancient India. I have seen a member of the council of the Royal Society (R. A. McCance, to be precise) turn up at a council meeting in shabby clothes with his luggage on his back in a knapsack. In India today the unworthy successors of Durvasa and Vishvamitra actually invite governors, vice-chancellors, and the like, to address them. This may be a relic of British Rule. If so, it is a regrettable one⁹.

India has made many contributions to world culture. Perhaps, the greatest is the ideal of non-violence. Europe's greatest contribution is the scientific method. If these can be married, their offspring may raise mankind to a new level¹⁰.

1. Extracted from *Science and Indian Culture*, New Age Publishers, Calcutta, 1965, p. 3.

2. *ibid*, p. 163.
3. *ibid*, p. 15.
4. *ibid*, pp. 14–15.
5. *ibid*, p. 19. It is regrettable that these ills have proliferated like cancer, instead of being removed.
6. *ibid*, pp. 76–80.
7. *ibid*, p. 26.
8. *ibid*, pp. 20–21.
9. *ibid*, pp. 23–24.
10. *ibid*, p. 58.